



*Una manera de hacer Europa*



# BUENAS PRÁCTICAS

## Actuaciones Cofinanciadas

The implementation of the reversible cells at  
La Moraleja station, on line 10 of the Madrid Metro  
Madrid Metro

**Programa Operativo  
de Madrid**

Año 2019

**Fondo Europeo de Desarrollo Regional**

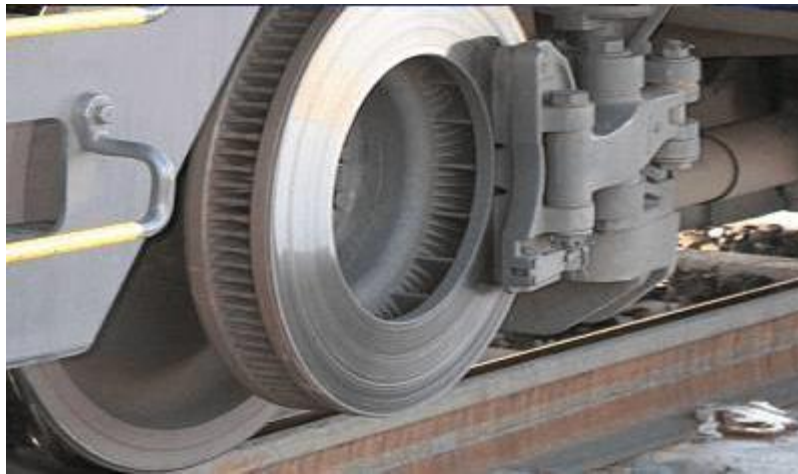


The implementation of the reversible cells at La Moraleja station, on line 10 of the Madrid Metro, is presented as good practice. The utility of these reversible cells consists in the transformation and reuse of the energy that was dissipated by braking the subway wheels, when they hit the tracks and thus transform it into new energy to improve the energy efficiency of the subway network itself.

This process of reusing this energy allows it to be used in lighting, elevators, escalators, etc., whereas in the past it could only be reused by another train, provided it was close to the first one.

The performance presented is located in the Traction Center of La Moraleja station, although it is planned to be also installed in Barrio del Puerto, La Peseta and Hospital de Móstoles stations, among others.

The eligible cost is 295,115 euros, with ERDF aid being 147,550 euros and the estimated impact of each cell of 650 megawatt hours per year, which is equivalent to the annual energy consumption of 200 average households.



It is considered good practice because it meets the following criteria:

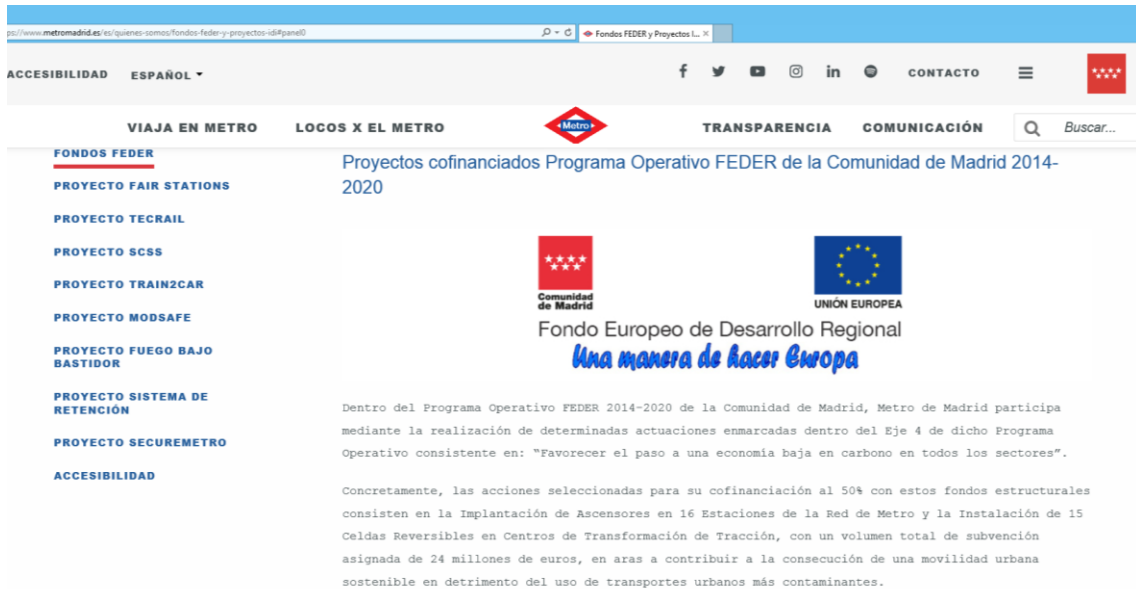
1. The action has been conveniently disseminated among the beneficiaries and the general public.

In addition to what is mandatory to recover the aforementioned aid from the ERDF, such as the sign indicating European aid at the station.



ERDF fund co-financing poster of the Reversible Cells of La Moraleja Station.

As well as the reference to the action in its specific section in the unique portal of Spain:



Likewise, Madrid Metro has launched a twitter in February 2020 about the co-financing by the European Union through the ERDF of this project to install reversible cells at La Moraleja station.



Twitt communicating the ERDF co-financing of the reversible cells of La Moraleja, La Peseta and Hospital de Móstoles.

And a video has also been produced for the assembly of the International Union of Public Transport (UITP), which was held in Madrid at the end of 2019, coinciding with the centenary of the Metro.

Presentación Subterránea 291019 (002).pptx [solo lectura] - PowerPoint

De Santiago Laporte, Antonio

ADVERTENCIA DE SEGURIDAD Se han bloqueado las referencias a las imágenes externas. Habilitar contenido

## Celdas reversibles

Una manera de hacer Europa

En 2018 se ha contratado el suministro y montaje de cuatro nuevos equipos recuperadores de energía

Datos del contrato (*)	
Presupuesto adjudicación	1.203.350,14 €
Adjudicatario	UTE CITRACC-ISTEM
Firma de contrato	24 mayo 2018
Plazo de ejecución	24 meses
Ubicaciones seleccionadas para los 4 recuperadores	La Moraleja
	La Peseta
	Hospital de Móstoles
	Barrio del Puerto

(\*) Proyecto cofinanciado por la Unión Europea (FEDER)

Haga clic para agregar notas

Diapositiva 16 de 23 Español (España)

15 Celdas reversibles

- Inicio de montaje equipos de recuperación de energía (RE) en la subestación de Campo de las Naciones (L10).
- El proyecto entrará en funcionamiento en julio (2018-2019).
- Durante este periodo la energía generada se usará en tráfico e L10.

16 Celdas reversibles

En 2018 se ha contratado el suministro y montaje de cuatro nuevos equipos recuperadores de energía

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17 Celdas reversibles

Equipos instalados en las subestaciones de recuperación de energía

18 Celdas reversibles

Equipos instalados en las subestaciones de recuperación de energía

## 2. The performance incorporates innovative elements.

The relevance and innovative aspect in this project is its relationship with the methodology of the so-called circular economy, consisting in the reuse of additional energy generated in a given point, for other alternative purposes, thus reducing the global energy consumption of the body that carries out the action.

Thus, as has already been said, this additional energy will mean significant energy savings at La Moraleja station, allowing to pay the cost of installations such as lighting, the energy required for the operation of escalators, etc.

## 3. Adequacy of results obtained to the established objectives.

The objectives that Metro Company and ultimately the Community of Madrid had when implementing this action, were to reduce energy consumption in its facilities. This means of transport is used preferentially by the citizens of Madrid, accounting for 43% of total journeys by public transport, and despite the fact that it is already the least polluting means of transport, it was intended to further lower its CO2 emission factor per traveler and km.

For this reason, the implementation of this action achieves the objective of reducing the emission of Greenhouse Gases by CO2 into the atmosphere, with an annual reduction of greenhouse gases of 338.65 Tons of CO2, in La Moraleja station, making Madrid Metro an even more sustainable and environmentally friendly means of transport.



## 4. Contribution to the resolution of a problem or weakness detected in the scope of execution.

The Community of Madrid is aware of the need for environmental improvement, especially in certain areas of the capital of Madrid and, therefore, has decided to give a substantial boost to those actions that, co-financed by the European Union, have a direct relationship with the energy efficiency. For this reason, Madrid Metro is aware of this situation and that, given the heat generated by the chafing of the wheels in the hot summer months and at peak times in this city, beyond even the aforementioned loss of energy, has launched this action that, in addition to energy savings, implies an improvement in the quality of life of the citizens of Madrid who use this means of transport, which will also lead to an increase in passengers

The recovery of braking energy will thus avoid waste in the form of heat in tunnels and stations, thus increasing comfort for users and reducing the resources intended to lower the temperature of the facilities, through the necessary air conditioning, especially at rush hours.

## 5. High degree of coverage over the target population.

As indicated, the metro option is used by almost the majority of those who use public transport in Madrid. In the case of La Moraleja station, this influx is an average working day of 5,099 people.

Therefore, the degree of coverage of this action is that of the entire population that uses this station, which, as already mentioned, will have a substantial improvement in their comfort in using this means of transport, to get to work and / or to get closer to their leisure areas or to cover their educational or health needs.

## 6. Consideration of horizontal criteria of equal opportunities and non-discrimination, as well as social responsibility and environmental sustainability.

This action will favor all people regardless of their gender, age, social status, disability, etc. Madrid Metro takes into account in all its facilities that these can be used without problem by all the people who need it, but with this action of taking advantage of energy to increase lights or facilitate access through escalators, elevators, etc. will further facilitate the mobility of users through La Moraleja station.

Regarding **environmental sustainability**, the installation of these reversible cells is fully focused on reducing the environmental impact of public transport and contributing to the reduction of greenhouse gas emissions.



## 7. Synergies with other policies or instruments of public intervention.

This operation is complementary to other actions developed by the Community of Madrid with the help of the ERDF. Thus, a line of aid has been launched for the municipalities of more than 35 thousand inhabitants of this Autonomous Community so that they can also initiate actions in energy efficiency and renewable energy in buildings and public infrastructures and actions to guarantee the promotion of sustainable urban mobility. These performances are as follows:

Among other actions, the aim is to replace and implement efficient lighting systems, supply and install regulation systems for lighting equipment, using presence detectors, natural light meters, shutdown programming, etc., or any other that contribute to the decrease in energy consumption of building lighting.

Likewise, the replacement and installation of more efficient heating, air conditioning and air conditioning systems, as well as energy losses, through the improvement of insulation measures and elements, improving the thermal envelope of buildings, the insulation of facades, covers, roofs and terraces of those infrastructures linked to the provision of public services, such as, among others, health, educational and social services centers.

Lastly, the renewal of the current fleets of vehicles for collective public transport, by incorporating vehicles with less polluting technologies, including electric and hybrid vehicles, promoting the use of bicycles and foot travel, through among other measures, the increase and improvement of the network of bike lanes, the promotion of services for rental and bicycle parking, investments in greenways, etc.

With these actions, the Community of Madrid, using the aid of the European Union, tries to promote sustainable growth in the region, promoting less polluting energy and reducing CO<sub>2</sub> in the different means of transport, using formulas that facilitate the reduction of polluting emissions.





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